

Patch Panel Design Consideration

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US CRP and BDE Meeting

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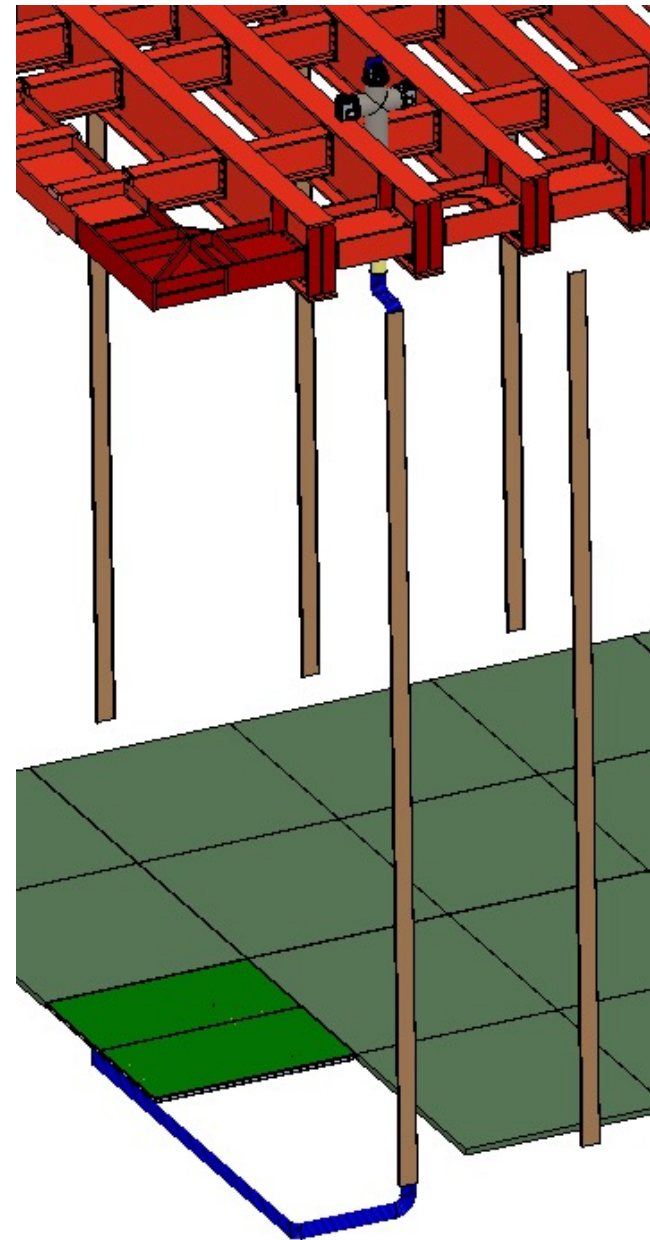
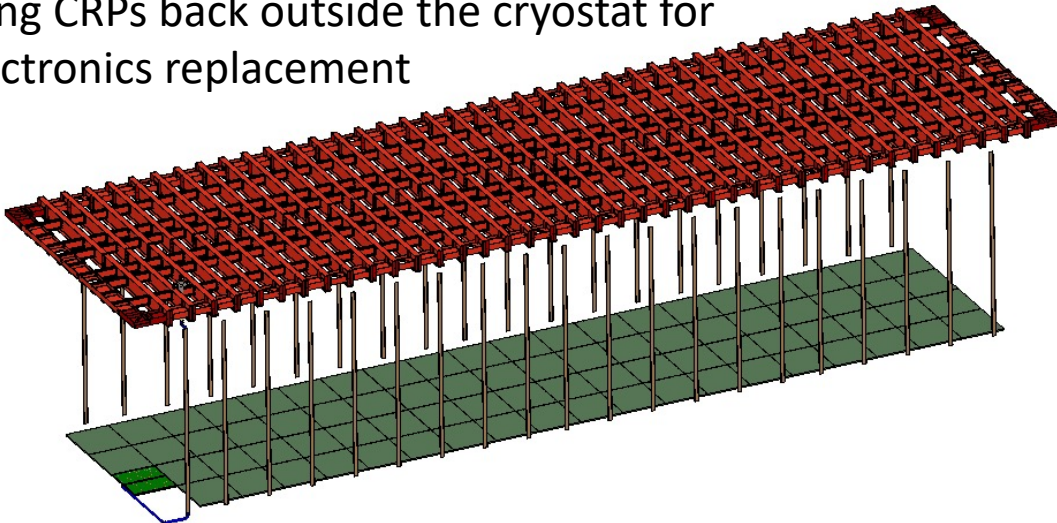
Cryostat Cabling

BDE cold cables (~25m long) need to be pre-installed before the field cage is assembled

To instrument 80 CRPs requires 1920 signal cables and 1920 power cables

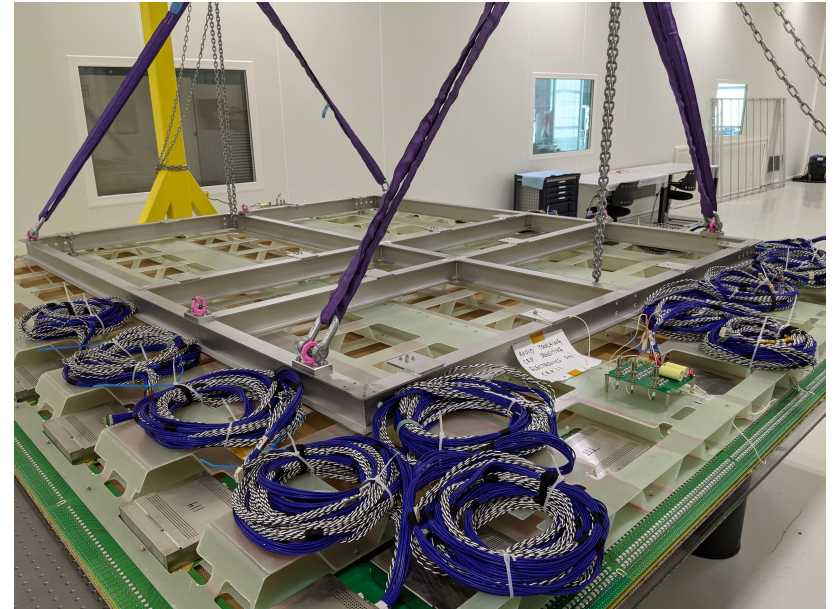
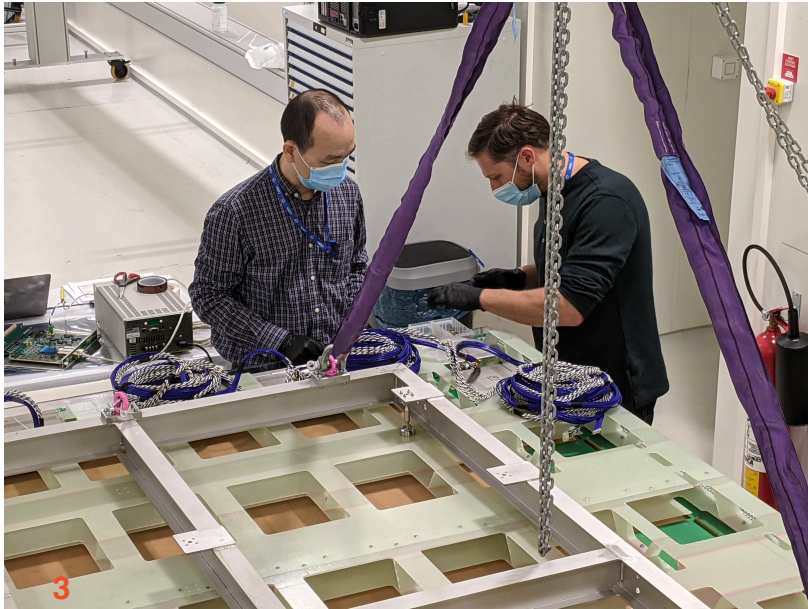
Cable connection is the most time-consuming portion of Bottom CRP installation. Electronics are mounted on the underside of the CRP

Would like to do as much installation and testing outside the cryostat to simplify the installation inside the cryostat. Also to minimize the need to bring CRPs back outside the cryostat for electronics replacement



Experience from VD Cold Box

- BDE installation and testing is much easier on a benchtop and facing up
- Easier to debug problems and replace items
- Yes, we can do the same cabling inside the cryostat, but:
 - Will need to work with FEMBs facing down, or
 - Design a fixture to rotate CRP 180deg with all cables in place



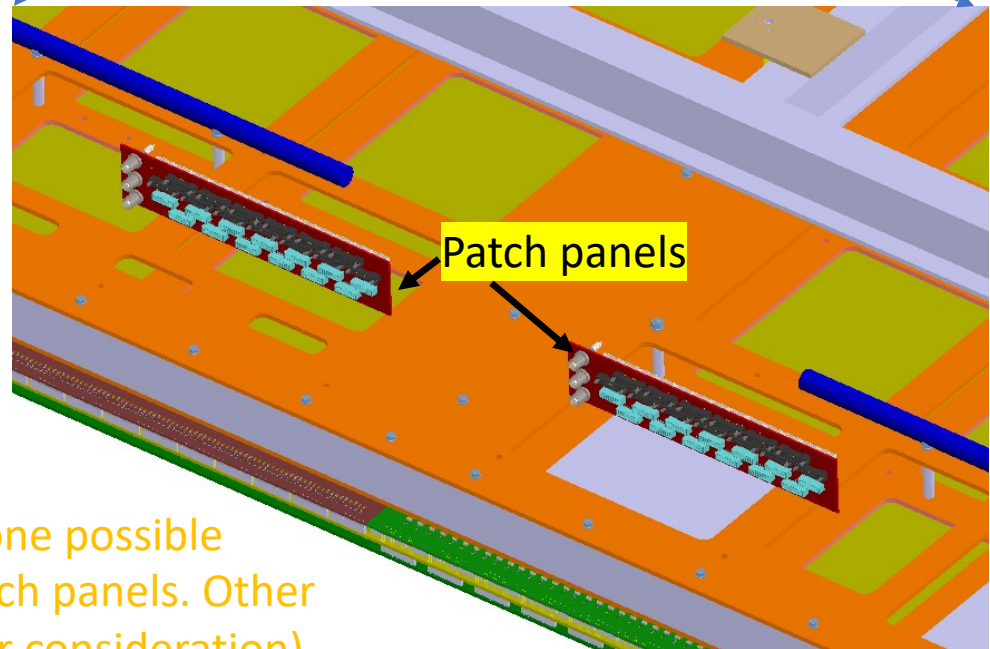
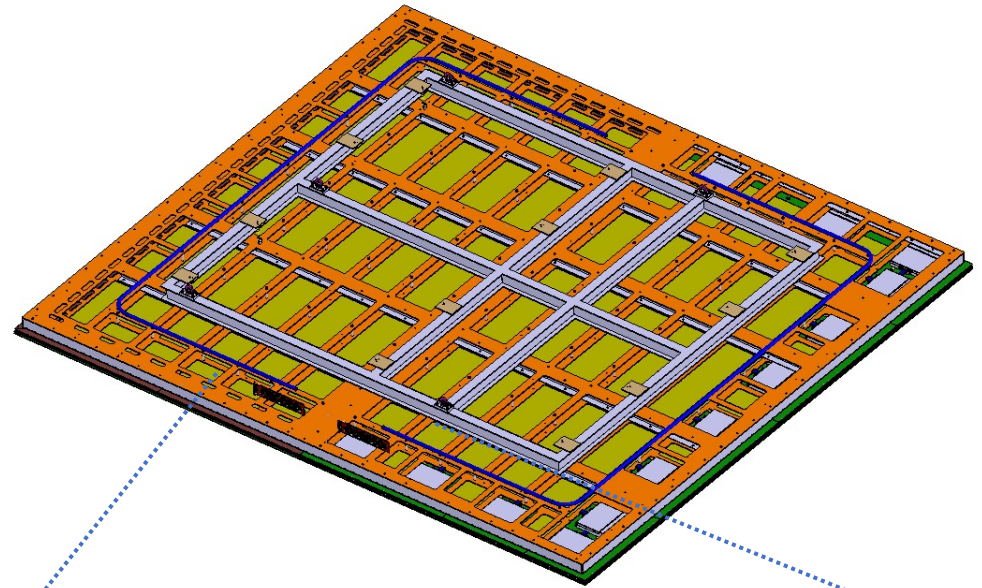
Patch Panel Concept

Install all FEMBs and route signal and power cables to patch panels at the CRP factories

Assembly is done at the CRU-level at the CRP factory

Cold cables inside the FD2 cryostat are routed to the location of the patch panels

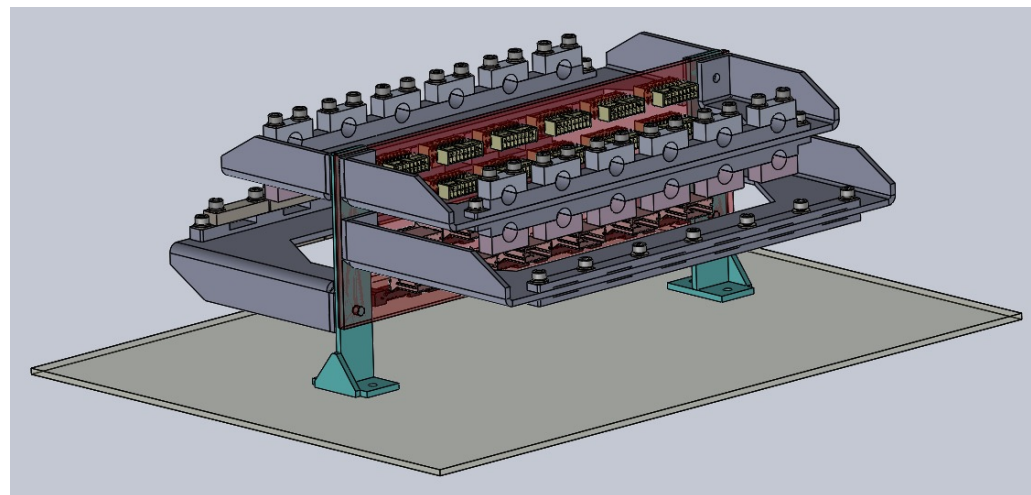
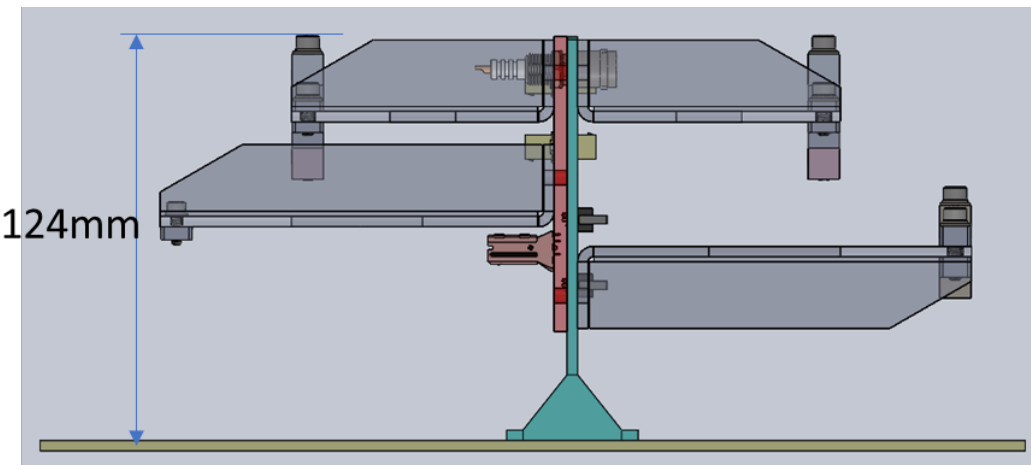
Final CE cabling inside the cryostat can be done with CRP resting in the final location (or close to it) on the support stands



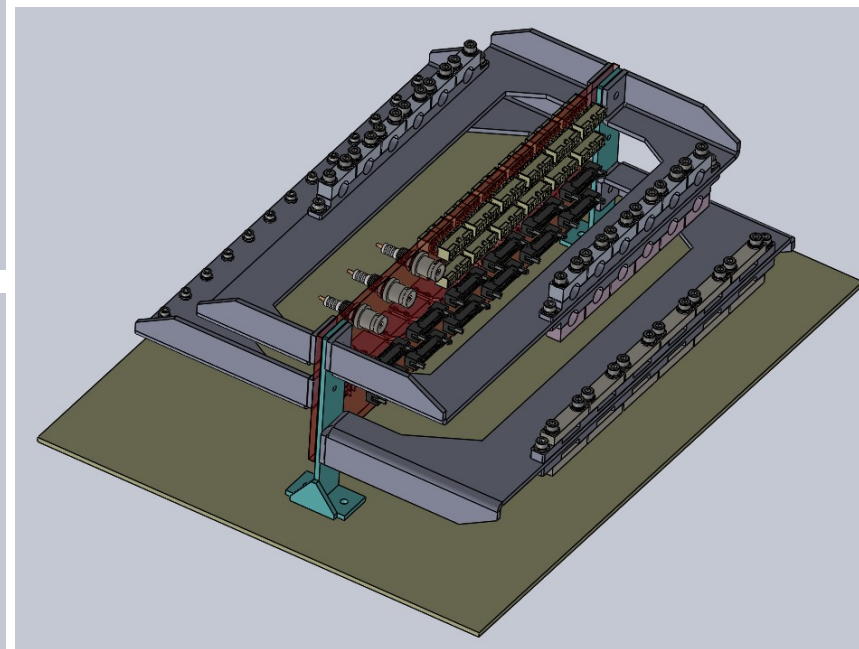
(Note: figure shows one possible placement of the patch panels. Other options are still under consideration)

Patch Panel Design

- Drawing of the patch panel has been passed on to the CRP Consortium for integration
- May need a few iterations to finalize the design and placement on the CRP



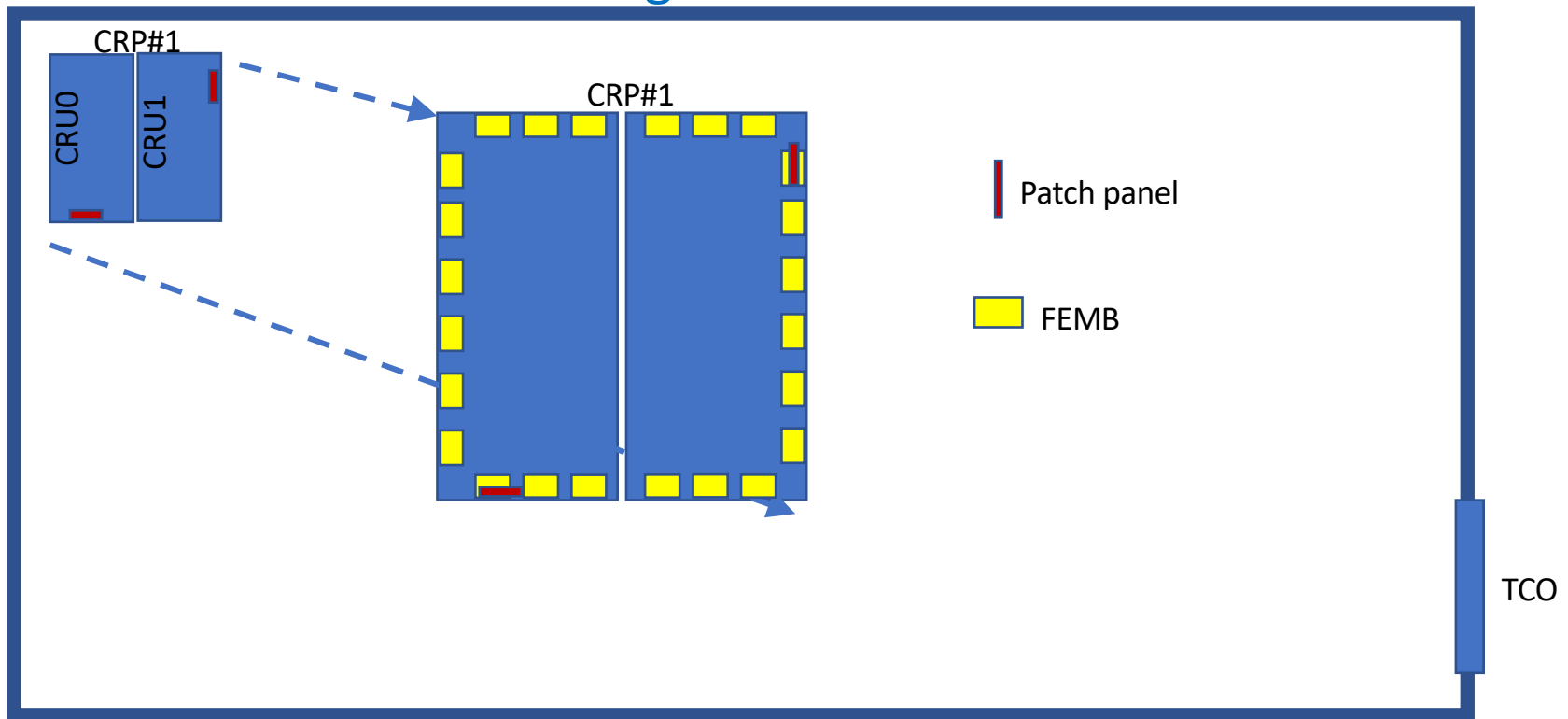
(From M. Zhao)



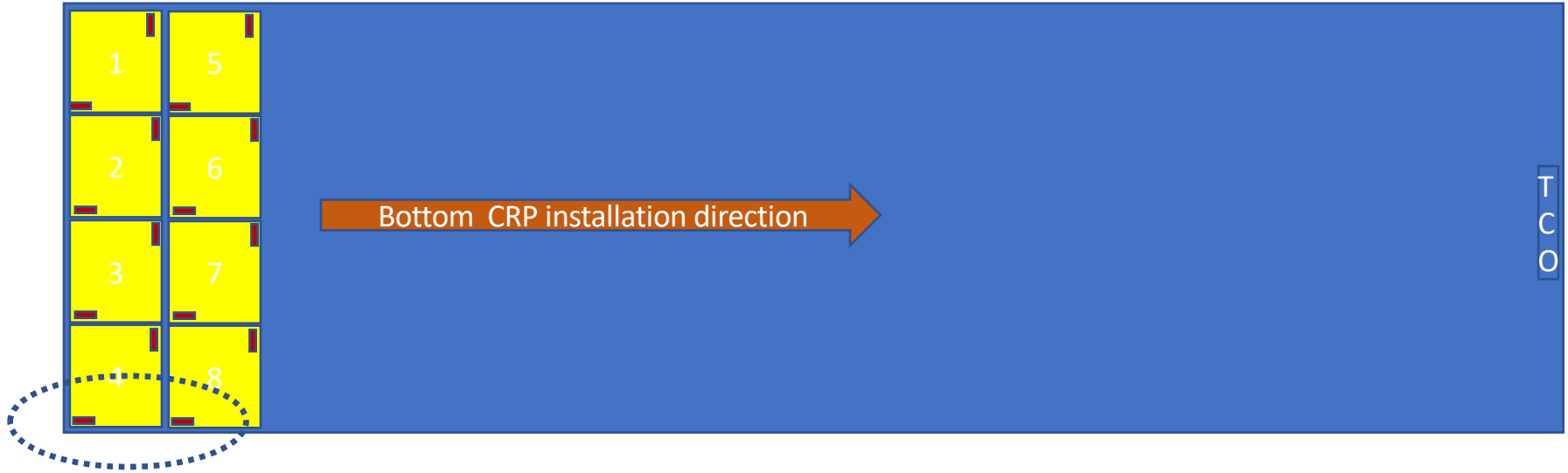
Location of the Patch Panels

- Exploring a number of options for placing the patch panels
- All have some pros and cons
- Below (configuration # 1) is a proposal from Dominique

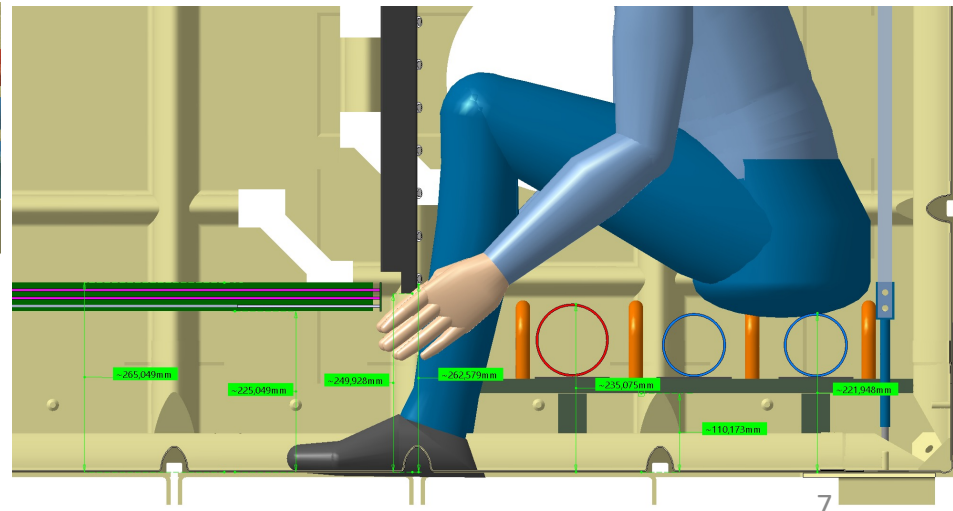
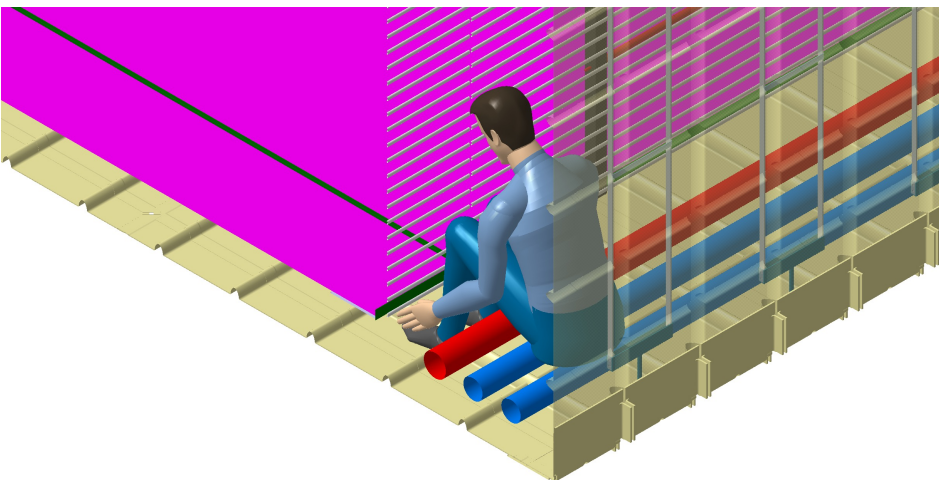
Configuration # 1



Each yellow rectangle is a complete CRP with 2 patch panels (red bars)
These patch panels are accessible directly after the CRP installation.

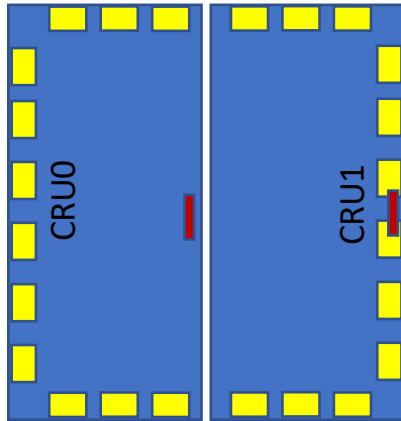


Bo discussed with Dimitar and Andrien about accessibility for the bottom row.
Enough space to reach under the field cage for cable connection

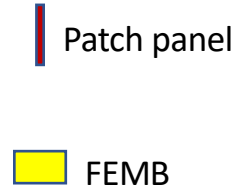
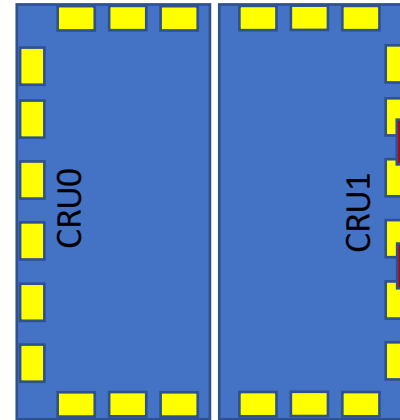


Other Placement Options

Configuration # 2 (preferred for BDE)



Configuration # 3



Pros:

- Patch panel easily accessible
- Patch cable ~ 3m

Cons:

- Install CRU instead of CRP inside the cryostat
- May need to joint the two CRUs inside the cryostat

Pros:

- Patch panel easily accessible

Cons:

- Longer patch cable (~5m)
- CRU0 patch panel can only be installed after the two CRUs are mounted on the composite frame (underground at SURF)

Summary

- Patch panel will significantly simplify the installation for Bottom CRP at SURF
- Placement of the patch panel on the CRP will need to be decided very soon (a couple of weeks). Has impact on
 - CRP/support design
 - CRP factory assembly sequence
 - SURF installation
- At the moment, configuration 2 is the preferred option for BDE. Need to study the implication for Bottom CRP design